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AMSAT NEWS SERVICE
ANS-072

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to: ans-editor [at] amsat.org

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see: https://mailman.amsat.org/postorius/lists/ans.amsat.org/

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ANS-072 AMSAT News Service Weekly Bulletins

To: All RADIO AMATEURS
From: Radio Amateur Satellite Corporation
712 H Street NE, Suite 1653
Washington, DC 20002

DATE 2022 Mar 13

January/February 2022 Issue of The AMSAT Journal Now Available

The January/February 2022 issue of The AMSAT Journal is now available to members on AMSAT’s Member Portal at https://launch.amsat.org/The_AMSAT_Journal

The AMSAT Journal is a bi-monthly digital magazine for amateur radio in space enthusiasts, published by the Radio Amateur Satellite Corporation (AMSAT). Each issue is your source for hardware and software projects, technical tips, STEM initiatives, operational activities, and news from around the world.

Inside the Current Issue:

* Apogee View – Robert Bankston, KE4AL
* Educational Relations Update - Alan Johnston, KU2Y
* Engineering Update - Jerry Buxton, N0JY
* Bob Bruninga, WB4APR, SK - Joe Kornowski, KB6IGK
* Space Weather for the Satellite Operator with Dr. Tamitha Skov - Paul Graveline, K1YUB
* An EZNEC Model for the Lindenblad Antenna - Grant Zehr, AA9LC

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[ANS thanks AMSAT for the above information]

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Study: Rapid Development of Satellite Mega-Constellations Risks Tragedies of the Commons

A study reported in Nature, “Satellite mega-constellations create risks in Low Earth Orbit, the atmosphere and on Earth,” in Scientific Reports (May 2021) by Aaron C. Boley and Michael Byers, says the rapid development of mega-constellations risks multiple tragedies of the commons. That could include tragedies to ground-based astronomy, Earth orbit, and Earth’s upper atmosphere. The study asserts that international cooperation is urgently needed, along with a regulatory system that takes into account the effects of tens of thousands of satellites.

“[T]he connections between the Earth and space environments are inadequately taken into account by the adoption of a consumer electronic model applied to space assets,” the authors said. “For example, we point out that satellite re-entries from the Starlink mega-constellation alone could deposit more aluminum into Earth’s upper atmosphere than what is done through meteoroids; they could thus become the dominant source of high-altitude alumina.”

The authors say their study shows that untracked debris will lead to potentially dangerous on-orbit collisions on a regular basis due to the large number of satellites within mega-constellation orbital shells. The total cross-section of satellites in these constellations also greatly increases the risk of impacts due to meteoroids. De facto orbit occupation by single actors, inadequate regulatory frameworks, and the possibility of free-riding exacerbate these risks.

According to Boley and Byers, in 2 years, the number of active and defunct satellites in low-Earth orbit (LEO) has increased by over 50%. “SpaceX alone is on track to add 11,000 more as it builds its Starlink mega-constellation and has already filed for permission for another 30,000 satellites with the [FCC].”

More than 12,000 trackable debris pieces are already in low-Earth orbit, typically 10 centimeters in diameter or larger, the study asserts. Including sizes down to 1 centimeter would raise the debris count to about a million inferred debris pieces that could threaten satellites, spacecraft, and astronauts due to their orbits crisscrossing at high relative speeds.

Simulations of the long-term evolution of debris suggest that LEO is already in the protracted initial stages of a mushrooming collision scenario, but that this could be managed through active debris removal. The addition of satellite mega-constellations and the general proliferation of low-cost satellites in LEO stresses the environment further, the study posits.

[ANS thanks ARRL for the above information]

Successful QO-100 Ham Radio Emergency Communications Exercise

On February 26, 22 stations representing 14 countries in IARU Region 1 took part in a short notice exercise using the geostationary satellite QO-100 amateur radio transponder

IARU Region 1 Emergency Communications Co-Ordinator Greg Mossop G0DUB has posted:

This was the first of a number of smaller exercises, tests and meetings to be held by IARU Region 1 throughout the year, building on the earlier Global Simulated Emergency Tests to cover as many aspects of emergency

communications as possible.

The intention is to bring emergency communicators together more frequently to demonstrate how the Amateur Radio Service can work together as a global community and develop a common understanding of each others' capabilities.

The exercise on QO-100 was felt to be a success with a number of formal messages being passed between stations along with some learning from the inevitable challenges of equipment failures, language barriers and co-ordination of an exercise whose coverage area covered from South Africa to the United Kingdom. Once all the exercise feedback is received, the next test on that system is planned to take place in October this year.

QO-100 brings another asset to the emergency communications toolbox in Region 1 and its presence is much appreciated.

Source IARU Region 1: https://iaru-r1.org/

QO-100 information: https://amsat-uk.org/satellites/geo/eshail-2/

[ANS thanks Southgate ARC for the above information]

Changes to AMSAT-NA TLE Distribution for March 10

Two Line Elements or TLEs, often referred to as Keplerian elements or keps in the amateur community, are the inputs to the SGP4 standard mathematical model of spacecraft orbits used by most amateur tracking programs. Weekly updates are completely adequate for most amateur satellites. TLE bulletin files are updated Thursday evenings around 2300 UTC, or more frequently if new high interest satellites are launched. More information may be found at https://www.amsat.org/keplerian-elements-resources/

The following satellite names have been corrected to their assigned AMSAT OSCAR designations.

EASAT-2 (Cat ID 51081) has been corrected to SO-114.
Hades   (Cat ID 51080) has been corrected to SO-115.

Thanks to Paul Stoetzer, N8HM, for a heads up on this correction.

[ANS thanks Ray Hoad, WA5QGD, AMSAT Orbital Elements Manager, for the above information]

ARISS NEWS

Amateurs and others around the world may listen in on contacts between amateurs operating in schools and allowing students to interact with astronauts and cosmonauts aboard the International Space Station. The downlink frequency on which to listen is 145.800 MHz worldwide.

Kids Star Club Sayama, Sayama, Japan, direct via 8J1KSC. The ISS callsign is presently scheduled to be NA1SS. The scheduled crewmember is Mark Vande Hei, KG5GNP. Contact is go for: Thu 2022-03-17 10:21:47 UTC 51 deg.

Current mode set to cross band repeater (145.990 MHz up {PL 67} & 437.800 MHz down)
* Radio to be powered OFF to support US EVA on March 15.
* Radio to be powered OFF to support Soyuz docking on March 18.
* Radio to be powered OFF to support US EVA on March 23.

The latest information on the operation mode can be found at
https://www.ariss.org/current-status-of-iss-stations.html

The latest list of frequencies in use can be found at
https://www.ariss.org/contact-the-iss.html

[ANS thanks Charlie Sufana, AJ9N, one of the ARISS operation team mentors
for the above information]

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Cheyenne, Wyoming 82007
https://wyhamcon.org/site

[ANS thanks Paul Overn, KE0PBR, AMSAT Events page manager, for the above information]

Satellite Shorts From All Over

+ Congratulations to Christy (KB6LTY) and Gustavo (PR8KW) successfully digipeat on MIR-SAT 1 during testing and debugging of the digipeater. The Digipeater has been enabled on the satellite and will be opened throughout this weekend, that is Saturday 12th March and Sunday 13th March 2022. It will close on Monday 14th March 2022. The digipeater Callsign is 3B8MIR-1. Operators would really appreciate it if you could please provide some feedback on the BB, on Twitter @3b8DU or to my personal address (jean.marc.momple(a)gmail.com), it may be useful to identify any issues and take necessary actions. If all goes well MIR-SAT 1 the digipeater will be open every week-end (as a minimum) until reentry. (ANS thanks Jean Marc Momple, 3B8DU, for the above information)

+ Current operating schedules for IO-86 are being posted on Facebook. Follow the group "Creflo T S" for regular images of the schedule grid. (ANS thanks AMSAT-ID for the above information)

+ After at least seven years hurtling through space, a 3-ton (2.7 metric tons) discarded rocket stage probably smashed into the moon on March 4 at a blistering 5,771 mph (9,288 km/h). The discarded rocket stage was projected to land at Hertzsprung crater on the moon's far side at 7:25 a.m. EST (1225 GMT). This is the first time that space junk has accidentally collided with the lunar surface. But because the collision occurred on the moon's far side, it could take scientists months to find the crater and confirm the impact. Many experts believe that the junk is the spent upper stage of a rocket launched during one of China's first forays to the moon, in 2014. But Chinese officials disagree. (ANS thanks LiveScience for the above information)

+ The BIRDS-5 satellite, operating APRS on 145.825 MHz, as well as CW and 4k8 GMSK AX25 telemetry on 435.375 MHz, is scheduled to be deployed from the International Space Station this week. There seems to be some confusion as to the exact date and time of deployment, so watch for further information. (ANS thanks Tetsu Satou, JA0CAW, for the above information)

+ Astronaut Mark Vande Hei, KG5GNP, who holds the ongoing record for longest space flight, is set to end his 355 days in space in just three weeks. The plan is for him to land in Kazakhstan with two Russian cosmonauts on a Russian spacecraft. But on Feb. 26, Dmitry Rogozin, the head of Russia's Space Agency and a close ally to Russian President Vladimir Putin, posted a video in Russian that threatened to leave Vande Hei behind in space and detach Russia's segment of the space station altogether. NASA has remained silent on Rogozin's threats. (ANS thanks abcnews.go.com for the above information)

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In addition to regular membership, AMSAT offers membership to:

* Societies (a recognized group, clubs or organization).
* Primary and secondary school students are eligible for membership at one-half the standard yearly rate.
* Post-secondary school students enrolled in at least half time status

shall be eligible for the student rate for a maximum of 6 post-secondary
years in this status.
* Memberships are available for annual and lifetime terms.

Contact info [at] amsat.org for additional membership information.

73 and remember to help Keep Amateur Radio in Space!

This week's ANS Editor, Mark Johns, K0JM
k0jm at amsat dot org